

FIG.1

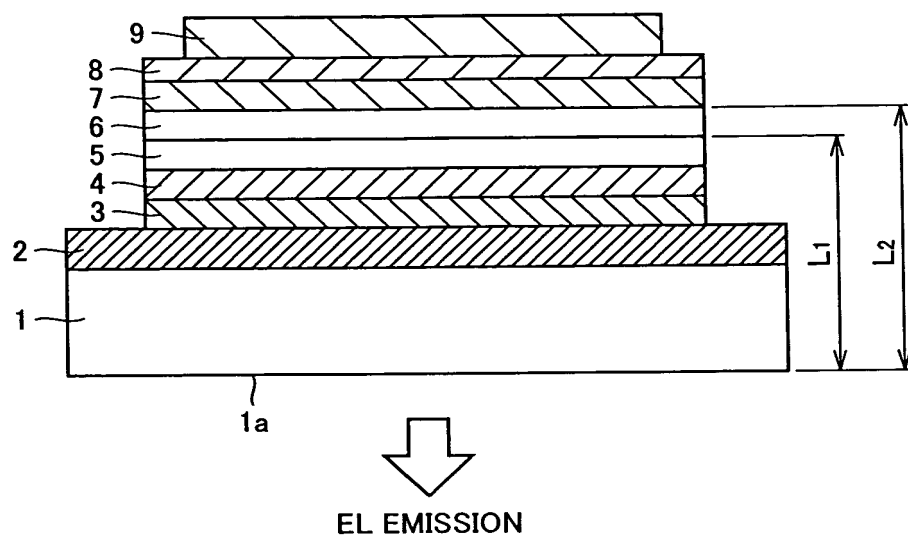


FIG.2

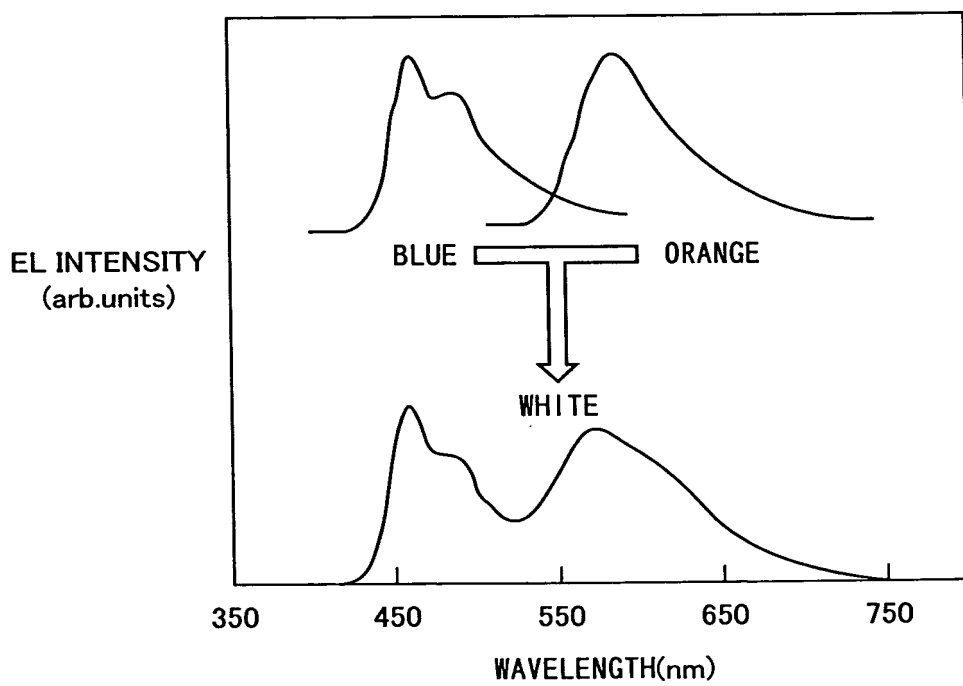


FIG.3

|                          | GLASS<br>SUB-<br>STRATE | TRANSPARENT<br>ANODE | HOLE<br>INJECTING<br>LAYER |             | HOLE<br>TRANSPORT<br>LAYER | ORANGE EMISSION<br>LAYER |             | BLUE EMISSION<br>LAYER | ELECTRON<br>TRANSPORT<br>LAYER | ELECTRON<br>INJECTING<br>LAYER/CATHODE |
|--------------------------|-------------------------|----------------------|----------------------------|-------------|----------------------------|--------------------------|-------------|------------------------|--------------------------------|--|
|                          |                         |                      | CuPC<br>(nm)               | CFx<br>(nm) |                            | NPB<br>(nm)              | DBzR<br>(%) |                        |                                |  |
| COMPARATIVE<br>EXAMPLE 2 | Glass<br>(mm)           | ITO<br>(nm)          | 10                         | 2           | 70                         | 10                       | 3%          | 60                     | 10                             | 1/200                                  |
|                          |                         |                      |                            |             |                            |                          |             |                        |                                |  |
| COMPARATIVE<br>EXAMPLE 1 | 0.7                     | 85                   | 10                         | 2           | 70                         | 10                       | 3%          | 20                     | 10                             | 1/200                                  |
|                          |                         |                      |                            |             |                            |                          |             |                        |                                |  |
| FIRST<br>EMBODIMENT      | 0.7                     | 85                   | 10                         | 2           | 65                         | 10                       | 3%          | 35                     | 10                             | 1/200                                  |

FIG.4

|                          |                              | Glass    | ITO | Cu <sub>2</sub> PC+OFx | NPB | NPB+DBzR | TBADN+TBP | Alq3 | TOTAL OPTICAL<br>FILM THICKNESS | DIGITAL FRACTION<br>OF m VALUE | $\lambda$ (nm) |
|--------------------------|------------------------------|----------|-----|------------------------|-----|----------|-----------|------|---------------------------------|--------------------------------|----------------|
| COMPARATIVE<br>EXAMPLE 2 | FILM THICKNESS<br>(nm)       | 7000000  | 85  | 12                     | 70  | 10       | 60        | 10   |                                 |                                |                |
|                          | OPTICAL DISTANCE<br>OF RED   | 10850000 | 153 | 13.2                   | 126 | 18       |           |      | 10850310                        | 0.528                          | 570            |
|                          | OPTICAL DISTANCE<br>OF BLUE  | 10850000 | 170 | 19.2                   | 126 | 18       | 108       |      | 10850441                        | 0.663                          | 460            |
|                          | OPTICAL DISTANCE<br>OF GREEN | 10850000 | 170 | 18                     | 126 | 18       | 108       |      | 10850440                        | 0.490                          | 510            |
| COMPARATIVE<br>EXAMPLE 1 | FILM THICKNESS<br>(nm)       | 7000000  | 85  | 12                     | 70  | 10       | 20        | 10   |                                 |                                |                |
|                          | OPTICAL DISTANCE<br>OF RED   | 10850000 | 153 | 13.2                   | 126 | 18       |           |      | 10850310                        | 0.528                          | 570            |
|                          | OPTICAL DISTANCE<br>OF BLUE  | 10850000 | 170 | 19.2                   | 126 | 18       | 36        |      | 10850369                        | 0.037                          | 460            |
|                          | OPTICAL DISTANCE<br>OF GREEN | 10850000 | 170 | 18                     | 126 | 18       | 36        |      | 10850368                        | 0.925                          | 510            |
| FIRST<br>EMBODIMENT      | FILM THICKNESS<br>(nm)       | 700000   | 85  | 12                     | 65  | 10       | 35        | 10   |                                 |                                |                |
|                          | OPTICAL DISTANCE<br>OF RED   | 1085000  | 153 | 13.2                   | 117 | 18       |           |      | 1085301.2                       | 0.149                          | 570            |
|                          | OPTICAL DISTANCE<br>OF BLUE  | 1085000  | 170 | 19.2                   | 117 | 18       | 63        |      | 1085387.2                       | 0.150                          | 460            |
|                          | OPTICAL DISTANCE<br>OF GREEN | 1085000  | 170 | 18                     | 117 | 18       | 63        |      | 1085386                         | 0.831                          | 510            |

FIG.5

INDEX OF REFRACTION OF EACH LAYER AT EACH  
WAVELENGTH OF RED, GREEN AND BLUE

| MEASURED<br>WAVELENGTH(nm) | Glass | ITO | CuPC+CF <sub>x</sub> | NPB | NPB+DBzR | TBADN+TBP |
|----------------------------|-------|-----|----------------------|-----|----------|-----------|
| 570(RED)                   | 1.55  | 1.8 | 1.1                  | 1.8 | 1.8      | 1.8       |
| 460(BLUE)                  | 1.55  | 2   | 1.6                  | 1.8 | 1.8      | 1.8       |
| 510(GREEN)                 | 1.55  | 2   | 1.5                  | 1.8 | 1.8      | 1.8       |

FIG.6

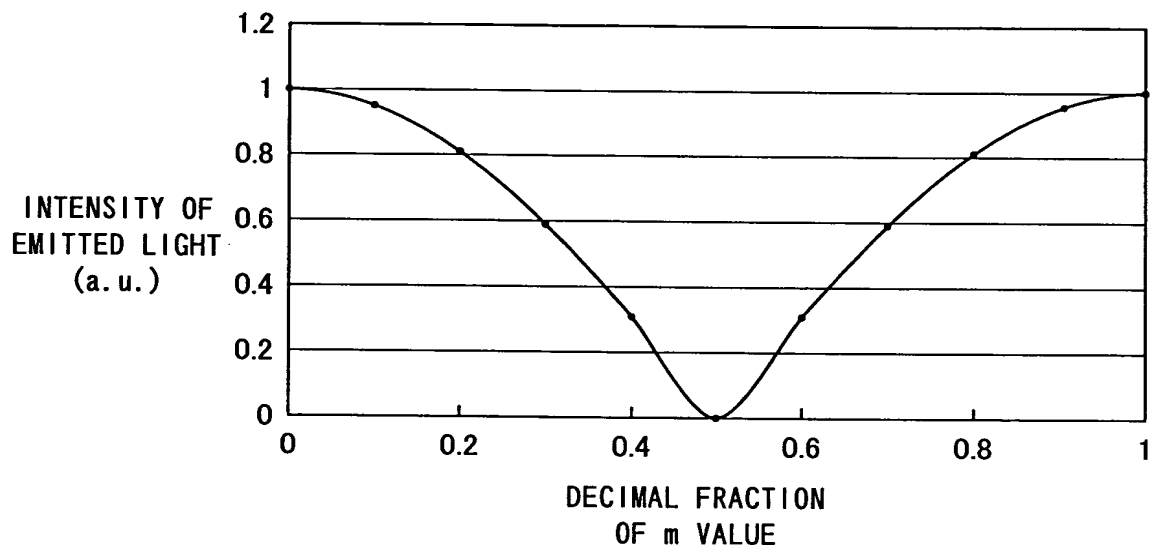


FIG.7

|                          | OPERATING<br>VOLTAGE | CHROMATICITY |       | LUMINOUS<br>EFFICIENCY |
|--------------------------|----------------------|--------------|-------|------------------------|
|                          |                      | CIE X        | CIE Y |                        |
| COMPARATIVE<br>EXAMPLE 2 | (V)                  |              |       | (cd/A)                 |
|                          | 6.78                 | 0.25         | 0.29  | 8.62                   |
| COMPARATIVE<br>EXAMPLE 1 | 6.58                 | 0.27         | 0.32  | 11.16                  |
| FIRST<br>EMBODIMENT      | 6.35                 | 0.29         | 0.39  | 13.31                  |

FIG.8

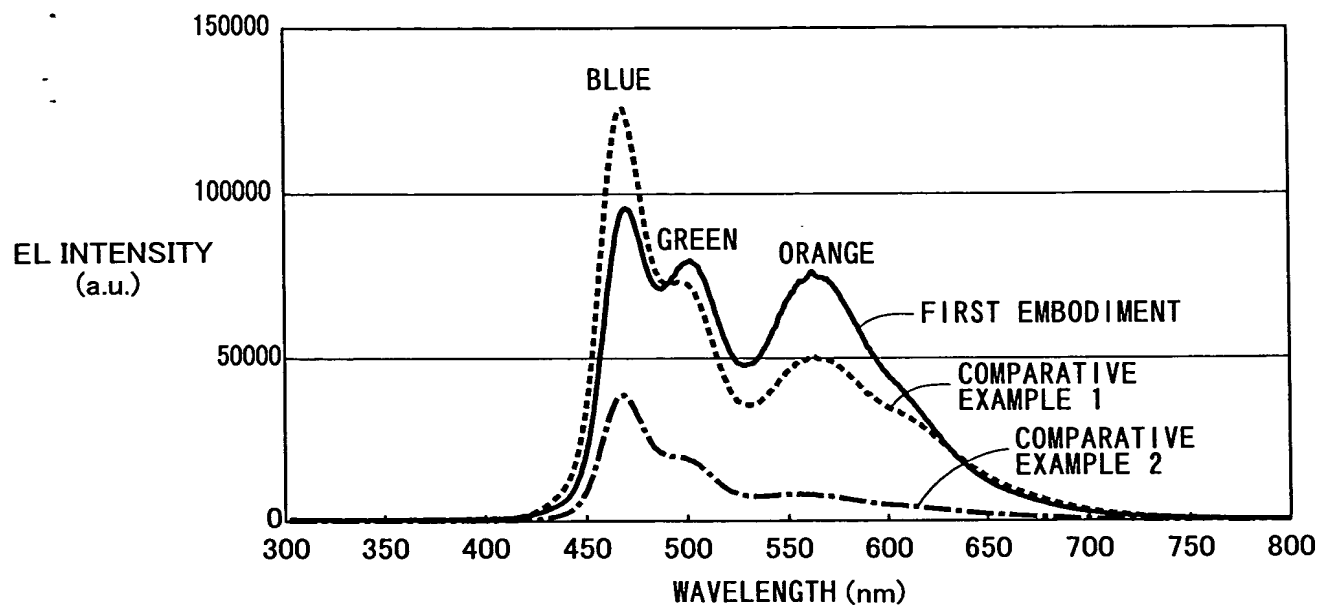


FIG.9

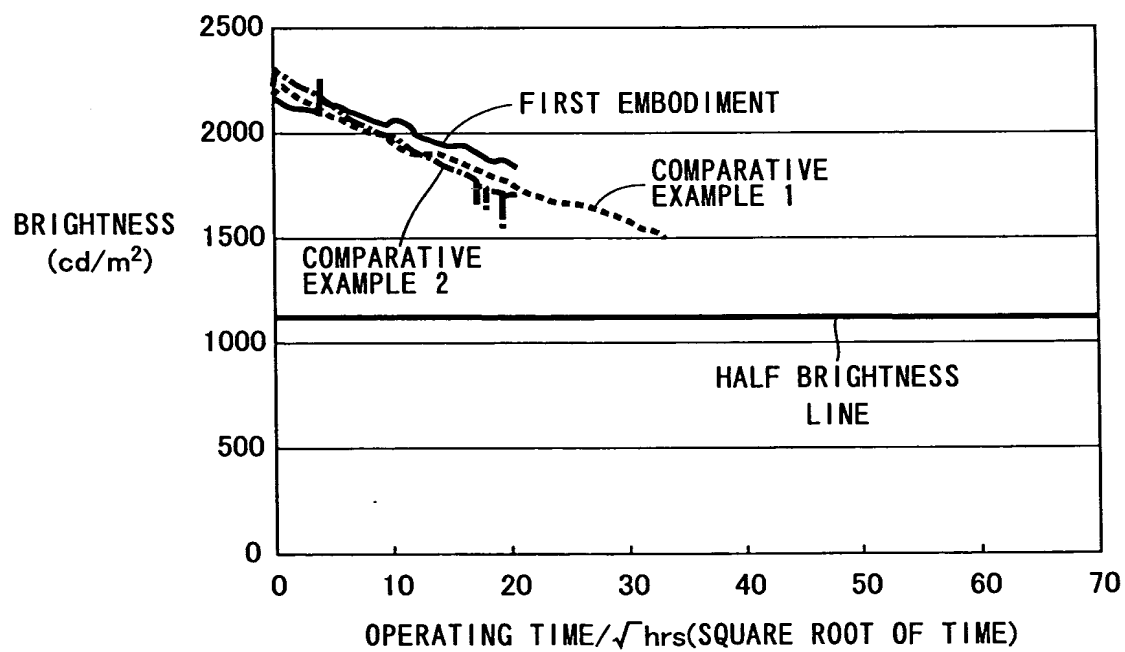


FIG.10

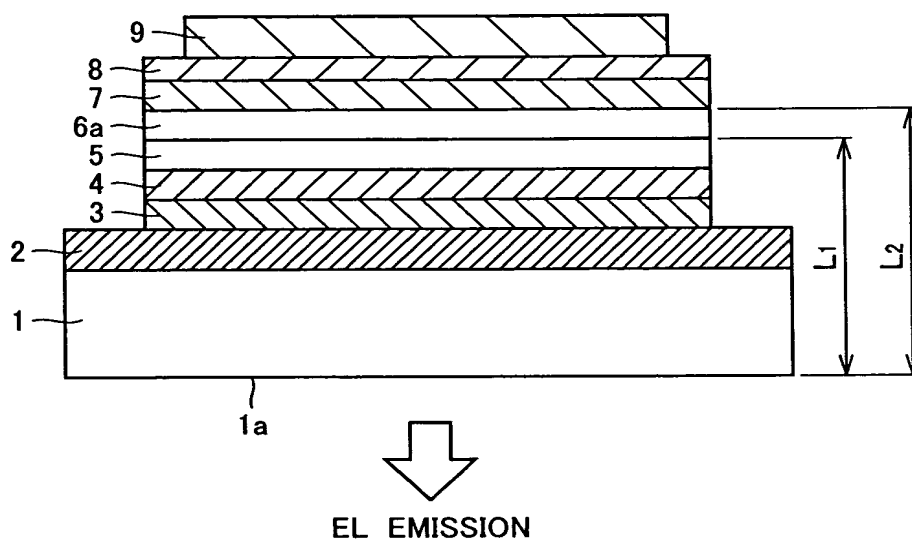


FIG.11

|                          | GLASS<br>SUB-<br>STRATE | TRANSPARENT<br>ANODE | HOLE<br>INJECTING<br>LAYER |             | HOLE<br>TRANSPORT<br>LAYER | ORANGE EMISSION<br>LAYER |             | BLUE EMISSION<br>LAYER |            | ELECTRON<br>TRANSPORT<br>LAYER | ELECTRON<br>INJECTING<br>LAYER/CATHODE |
|--------------------------|-------------------------|----------------------|----------------------------|-------------|----------------------------|--------------------------|-------------|------------------------|------------|--------------------------------|--|
|                          |                         |                      | CuPC<br>(nm)               | CFx<br>(nm) |                            | NPB<br>(nm)              | DBzR<br>(%) | TBADN<br>(nm)          | TBP<br>(%) |                                |  |
| COMPARATIVE<br>EXAMPLE 1 | Glass<br>(mm)           | ITO<br>(nm)          | 10                         | 2           | NPB<br>(nm)                | 10                       | 3%          | 95                     | 5%         | Alq3<br>(nm)                   | LiF/Al<br>(nm/nm)                      |
|                          |                         |                      |                            |             |                            |                          |             |                        |            |                                |  |
|                          |                         |                      |                            |             |                            |                          |             |                        |            |                                |  |
| COMPARATIVE<br>EXAMPLE 2 | 0.7                     | 85                   | 10                         | 2           | 40                         | 10                       | 3%          | 75                     | 5%         | 10                             | 1/200                                  |
| SECOND<br>EMBODIMENT     | 0.7                     | 85                   | 10                         | 2           | 60                         | 10                       | 3%          | 75                     | 5%         | 10                             | 1/200                                  |

FIG.12

|                          |                              | Glass   | ITO | CuPC+CFx | NPB | NPB+DBzR | TBADN+TBP | Alq3 | TOTAL OPTICAL<br>FILM THICKNESS | DICINAL FRACTION<br>OF m VALUE | $\lambda$ (nm) |
|--------------------------|------------------------------|---------|-----|----------|-----|----------|-----------|------|---------------------------------|--------------------------------|----------------|
| COMPARATIVE<br>EXAMPLE 1 | FILM THICKNESS<br>(nm)       | 700000  | 85  | 12       | 50  | 10       | 95        | 10   |                                 |                                |                |
|                          | OPTICAL DISTANCE<br>OF RED   | 1085000 | 153 | 13.2     | 90  | 18       |           |      | 1085274.2                       | 0.959                          | 570            |
|                          | OPTICAL DISTANCE<br>OF BLUE  | 1085000 | 170 | 19.2     | 90  | 18       | 171       |      | 1085387.2                       | 0.150                          | 460            |
|                          | OPTICAL DISTANCE<br>OF GREEN | 1085000 | 170 | 18       | 90  | 18       | 171       |      | 1085386                         | 0.831                          | 510            |
| COMPARATIVE<br>EXAMPLE 2 | FILM THICKNESS<br>(nm)       | 700000  | 85  | 12       | 40  | 10       | 75        | 10   |                                 |                                |                |
|                          | OPTICAL DISTANCE<br>OF RED   | 1085000 | 153 | 13.2     | 72  | 18       |           |      | 1085256.2                       | 0.833                          | 570            |
|                          | OPTICAL DISTANCE<br>OF BLUE  | 1085000 | 170 | 19.2     | 72  | 18       | 135       |      | 1085333.2                       | 0.680                          | 460            |
|                          | OPTICAL DISTANCE<br>OF GREEN | 1085000 | 170 | 18       | 72  | 18       | 135       |      | 1085332                         | 0.408                          | 510            |
| SECOND<br>EMBODIMENT     | FILM THICKNESS<br>(nm)       | 700000  | 85  | 12       | 60  | 10       | 75        | 10   |                                 |                                |                |
|                          | OPTICAL DISTANCE<br>OF RED   | 1085000 | 153 | 13.2     | 108 | 18       |           |      | 1085292.2                       | 0.086                          | 570            |
|                          | OPTICAL DISTANCE<br>OF BLUE  | 1085000 | 170 | 19.2     | 108 | 18       | 135       |      | 1085369.2                       | 0.993                          | 460            |
|                          | OPTICAL DISTANCE<br>OF GREEN | 1085000 | 170 | 18       | 108 | 18       | 135       |      | 1085368                         | 0.690                          | 510            |

FIG.13

INDEX OF REFRACTION OF EACH LAYER AT EACH  
WAVELENGTH OF RED, GREEN AND BLUE

| MEASURED<br>WAVELENGTH (nm) | Glass | ITO | CuPC+CFx | NPB | NPB+DBzR | TBADN+TBP |
|-----------------------------|-------|-----|----------|-----|----------|-----------|
| 570 (RED)                   | 1.55  | 1.8 | 1.1      | 1.8 | 1.8      | 1.8       |
| 460 (BLUE)                  | 1.55  | 2   | 1.6      | 1.8 | 1.8      | 1.8       |
| 510 (GREEN)                 | 1.55  | 2   | 1.5      | 1.8 | 1.8      | 1.8       |

FIG.14

|                          | OPERATING<br>VOLTAGE | CHROMATICITY |       | LUMINOUS<br>EFFICIENCY |
|--------------------------|----------------------|--------------|-------|------------------------|
|                          | (V)                  | CIE X        | CIE Y | (cd/A)                 |
| COMPARATIVE<br>EXAMPLE 1 | 5.37                 | 0.36         | 0.40  | 8.14                   |
| COMPARATIVE<br>EXAMPLE 2 | 5.15                 | 0.36         | 0.42  | 7.42                   |
| SECOND<br>EMBODIMENT     | 6.71                 | 0.35         | 0.39  | 10.02                  |

FIG.15

